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(Article begins on next page)

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**ABSTRACT**

The smoking of tobacco among adolescents is due to several influential factors, both individual and social. The present study aimed at comparing the effects of different variables on adolescent cigarette smoking, specifically, peer and parent modelling, self-regulatory efficacy, and parental degree of care as perceived by the adolescent. Data were collected by means of a self-report questionnaire administered to a sample of 229 secondary school students aged between 15 and 20 years (mean= 16.69, SD= 1.14). To test the influence of different variables, we performed a binary logistic regression analysis. Results indicated that the father is a key figure in that his care and affection can prevent adolescents from becoming a smoker and his modelling is a risk factor. The significant influence of friends was also confirmed and indicated that peer modelling is a strong predictor of adolescent cigarette smoking. Finally, the results revealed that self-regulatory efficacy is a relevant psychological variable capable of preventing smoking initiation during adolescence.

**KEYWORDS:** adolescence; tobacco use; parental care; modelling; self-regulatory efficacy

## **The relation of modelling and the perception of parental care with adolescent smoking: a cross-sectional study**

Tobacco use is a major public health problem and an important risk factor for several deadly diseases (World Health Organization, 2016). As most adults who smoke began smoking during adolescence, it is of interest to understand why adolescents begin to smoke regularly (Calafat, García, Juan, Becoña & Fernández-Hermida, 2014). Some authors have proposed an interactional approach to the study of the aetiology of adolescent substance use given that people develop a reciprocal interaction with their surrounding environments (Brook, Cohen, Whiteman & Gordon, 1992). According to this theory, adolescent cigarette use can also be considered the result of interactions among intrapersonal variables, such as attitudes, beliefs and personality, and the social environment, which includes family and peers (Petraitis, Flay & Miller, 1995). On the basis of such an approach, the present study aimed to compare the effects of different variables on adolescent cigarette smoking. Accordingly, we investigated the influence of an intrapersonal variable, such as self-regulatory efficacy, and the impact of the environmental system, namely, peer and parent modelling, as well as parental care as perceived by the adolescent. We also take into account the effects of gender and age because these sociodemographic variables have been linked to youth smoking (Tyas & Pederson, 1998). Regular smoking among youth typically increases with age (Reddy, Resnicow, Omardien & Kambaran, 2007), a trend that was also found in the Italian context (ISTAT, 2016a). With respect to gender differences, in most European countries (including Italy), smoking rates are similar for boys and girls (ESPAD group, 2016).

Modelling, self-efficacy and smoking

Many studies have concluded that tobacco use by parents is a risk factor for teen smoking, specifically, youths who are around family members who smoke are significantly more likely to become smokers themselves (Distefan, Gilpin, Choi & Pierce, 1998; Wilson, McClish, Heckman, Obando & Dahman, 2007). It is likely that adolescents whose parents smoke learn that smoking is acceptable or even desirable (Escario & Wilkinson, 2015). Furthermore, parents who smoke may lack credibility as antismoking advocates (Jackson & Henriksen, 1997). The literature further reveals a contrast regarding the maternal and paternal impacts on adolescent smoking with some studies determining that mothers who smoke exert a stronger influence on their children's probability of becoming smokers than do fathers who smoke (Melchior, Chastang, Mackinnon, Galéra & Fombonne, 2010; Escario & Wilkinson, 2015). Scholars have explained this result by suggesting that because mothers typically devote a greater fraction of time to child care (García-Mainar, Molina & Montuenga, 2011) and, hence, spend more time with their children than do the fathers, the mothers are the primary role model. Other studies have maintained that the father's smoking is also important (Gilman, Rende, Boergers, Abrams, Buka, Clark et al., 2009), especially when the father is more present in the home. Moreover, the family structure is also a relevant factor. A longitudinal study conducted on a large adolescent sample in the Netherlands found that a single-parent smoker increases the risk of adolescent smoking more so than one parent who smokes in a two-parent family (Otten, Engels, van de Ven, & Bricker, 2007).

Additionally, a large body of research indicates that not only parental modelling but also peer modelling plays a crucial role in the initiation of adolescent smoking (Hoffman, Monge, Chou & Valente, 2007; Bricker, Rajan, Zalewski, Ramey, Peterson & Andersen, 2009). During adolescence, youth seek increased emotional security from and social connectedness with their peers, while simultaneously hoping to gain autonomy from their parents (Bauman, Carver & Gleiter, 2001). This need for adolescents to feel connected to their friends can lead them to behave in ways consistent with the standards and norms of the group (Simons-Morton & Farhat, 2010). Conforming to group norms occurs through the process of socialization, whereby an adolescent is accepted into the group

based on shared characteristics, and conversely, to be accepted, the adolescent adopts the attitudes and behaviours of the group (Evans, Powers, Hersey & Renaud, 2006). However, not all adolescents engage in these prescribed behaviours when the peer group urges them to do so, and as a result, there exists an important psychological factor that impacts the difference in predicting various outcomes, namely, a perceived self-regulatory efficacy to resist social pressures to engage in antisocial activities (Bandura, Barbaranelli, Caprara, Pastorelli & Regalia, 2001). More specifically, a low sense of efficacy to ward off peer pressure to pursue harmful activities creates a vulnerability to strong social influences; thus, the adolescent's confidence in his ability to refuse involvement in transgressive behaviours is a protective and preventive factor from engaging in risky behaviours (Bandura et al., 2001). Self-efficacy has also been determined to be an important predictor of adolescent smoking, such that higher levels of self-efficacy seem to protect adolescents from smoking initiation not only among middle-school students (Grogan, Conner, Fry, Gough & Higgins, 2009; Lotrean, Dijk, Mesters, Ionut & De Vries, 2010) but also among older adolescents (Chang, Lee, Lai, Chiang, Lee & Chen, 2006).

#### The role of parental care

In addition to the negative effects of modelling, parental relationships may have a protective effect against smoking. Several studies have indicated that the quality of the parent-child relationship is highly related to adolescent substance abuse, including cigarette smoking, such that the lack of parental concern or parental support and the existence of parent-child conflict seem to be associated with youth smoking (Aquilino & Supple, 2001; Wilson et al., 2007). Furthermore, the relationships with both parents are important for adolescent development, even though it is generally acknowledged that each parent plays a different role in the socialization of the adolescent (Smetana, Campione-Barr & Metzger, 2006). Accordingly, it is beneficial to investigate the differential effects of the maternal and paternal relationships on adolescent cigarette smoking. In Western societies, the relatively higher involvement of mothers than fathers in the socialization of the adolescent suggests

that the mother-child relationship has a greater impact on various adjustment outcomes (Shek, 2005). With regard to adolescent cigarette smoking, most studies have combined the impacts of parental interactions rather than investigating the independent influence of mothers and fathers. However, while there are some recent studies that have distinguished between the maternal and paternal dimensions, the results are mixed with some researchers (Jiménez-Iglesias, Moreno, Rivera & García-Moya, 2013) suggesting that the mother's support is more protective than that of the father's, and others (White, 2012) providing evidence that only the frequency of supportive father-child conversations was associated with a reduced risk of smoking experimentation in early adolescence. To our knowledge, no study that differentiates maternal effects from paternal effects has been conducted in the Italian context. Both maternal bonding and paternal bonding are either stronger or weaker depending on the specific European or American countries involved. In particular, emotional bonding with the mother is determined to be stronger in Italy than it is in other European countries (Claes, Lacourse, Bouchard & Perucchini, 2003). For this reason, a study in the Italian context that considers separately the role of maternal and paternal care was needed.

#### The current study

At approximately twice the European average, the rate of daily cigarette use among the adolescent population in Italy is extremely high, (ESPAD group, 2016).

Hence, as adolescent cigarette use is determined to be a problem of great magnitude in Italy, the study of the predictors of smoking in this context are of particular important. To date, some studies have investigated the psychosocial determinants of tobacco use among Italian adolescents, finding that the smoking habits of parents and friends influence adolescent smoking behaviours (Bergamaschi, Gambi, Gentilini, Monti, Stampi & Zanetti, 2000) and that a positive family climate can act as a protective factor (Giannotta, Ortega & Ciairano, 2013). However, to our knowledge, no study conducted in the Italian context has investigated the differential impacts between maternal and paternal influences, and thus, there is a need for studies that take into consideration these

different dimensions given that the role of the family is especially strong in Italy (Claes et al., 2003). Moreover, previous studies have focused on the influence of social variables, whereas the present study also considers the effect of a psychological factor, namely, perceived self-regulatory efficacy. This paper seeks to present an original contribution to the study of the predictors of adolescent smoking in the Italian context by making use of an interactional approach and by differentiating between maternal from paternal influences. On the basis of previous literature, we expect that (a) while older adolescents are more likely to smoke cigarettes than younger adolescents (Tyas & Pederson, 1998), there may be no differences between genders (Page & Danielson, 2011; ESPAD group, 2016); (b) smoking by friends and parents, especially the mother, increases the probability that the adolescent in the family will smoke tobacco (Hoffman et al., 2007; Escario & Wilkinson, 2015); (c) self-regulatory efficacy decreases the likelihood of smoking (Chang et al., 2006; Lotrean et al., 2010); and (d) greater parental care as perceived by the adolescent decreases the likelihood of adolescent smoking (Jiménez-Iglesias et al., 2013).

## METHOD

### Participants

The data presented herein are part of those collected from a survey administered to Italian high school students. We selected the participants via a purposive sampling method. To include adolescents of different sociocultural environments and ages in the study, we chose four classes from three different secondary schools, namely, one lyceum, one technical school, and one vocational school. In each school, we randomly selected two second-year classes and two four-year classes. The regions in which the schools were located had a percentage of smokers equal to the national percentage (ISTAT, 2016a). We contacted students in the classrooms, asked for voluntary participation and guaranteed anonymity. The participants did not receive any incentive to respond. All invited students agreed to participate. The sample included 229 adolescents (57.2% male, 42.8%

female; age range 15 to 20 years, mean = 16.69, SD = 1.14), with 30.1% attending the lyceum, 36.2% attending the technical school, and 33.6% attending the vocational school.

## Measures

Participants completed a self-report questionnaire that included different sets of indicators. The indicators used in the analyses were as follows:

- A set of items that investigated smoking by the participants, their parents, and their peers. One item asked whether the participant had ever smoked, had smoked at least one time, or smokes regularly; one item asked whether the parents of the participant smoke (neither smokes, only the mother smokes, only the father smokes, both smoke); and one item asked how many of their friends smoke (none smoke, some smoke, many smoke).
- Two subscales of the brief current form of the Parental Bonding Instrument, (Klimidis, Minas, & Ata, 1992) that measure the child's perception of the mother's care and father's care. Each subscale consists of four items, e.g., 'My father/mother seems to understand my problems', rated on a 3-point Likert-type scale that ranges from 1 (almost never) to 3 (almost always). Both subscales, the perception of the mother's care (Cronbach's  $\alpha=.69$ ) and the perception of the father's care (Cronbach's  $\alpha=.70$ ), exhibited good internal consistency. The mean scores of each subscale were calculated.
- The Italian Perceived Self-Regulatory Efficacy Scale (Pastorelli & Picconi, 2001) included 12 items rated on a 4-point Likert-type scale that ranged from 1 (completely incapable) to 4 (very capable), e.g., 'How much are you able to resist if your friends urge you to do something risky or forbidden?' The scale revealed good internal coherence ( $\alpha=.86$ ). The mean score for the scale was calculated.
- A brief list of socio-demographic items, e.g., gender and age.



In addition to the descriptive statistics, we explored gender differences in smoking via Chi-square and we tested the influence of gender, age, modelling, self-regulatory efficacy, and care perceived by parents on the probability of smoking via binary logistic regression analysis. We recoded the variable concerning smoking in a dichotomous one: smoking regularly (0=no; 1=yes). We recoded into a dichotomous variable the item concerning friends smoking too because almost none of the participants reported that no one of their friends were smoker. The new variable was named “having many smoking friends”.

## RESULTS

### Descriptive statistics

The questionnaire revealed that 34.5% of the participants had never smoked, 31.9% had smoked at least one time but did not smoke regularly, and 33.6% were habitual smokers, i.e., they smoked every week. There were no significant differences between male and female participants as assessed via a Chi-square test. These results are similar to the most recent national data. The 2015 European School Survey on Alcohol and Other Drugs (ESPAD, 2016) reported that 42% of the participants had never smoked and 37% had smoked during the last month. In our sample, the percentage of participants who had never smoked is lower, but our sample is older than that of the ESPAD (mean age = 15.7). Moreover, 20.6% of the participants' mothers and 23.6% of the participants' fathers were smokers. With respect to friends, 3.1% of the participants affirmed that none of their friends smoked, 37.9% affirmed that some of their friends were smokers, and 59% reported that many of their friends were smokers. Participants perceived slightly more care from their mothers ( $M = 2.53$ ;  $SD = .45$ ) than from their fathers ( $M = 2.28$ ;  $SD = .52$ ). With respect to the self-regulatory efficacy, participants had a mean score of 3.19 and a standard deviation of .57.

## Regression analysis

The influence of the independent variables on the probability of smoking regularly was examined via a binary logistic regression that estimated the effect of the following variables: gender (0=female, 1=male); age; smoking mother (0=no, 1=yes); smoking father (0=no, 1=yes); many smoking friends (0=no, 1=yes), self-regulatory efficacy; perceived mother's care; and perceived father's care. Table 1 presents the odds ratios of each independent variable. The fit of the model was acceptable:  $\chi^2(8)=82.49$ ,  $p<.01$ . Three variables significantly increased the probability of smoking regularly, namely, age (OR = 1.64; 95% CI = 1.14–2.32); smoking father (OR = 2.45; 95% CI = 1.05–5.75), and many smoking friends (OR = 5.47; 95% CI = 2.36–12.67). Two variables decreased the probability of smoking regularly, namely, self-regulatory efficacy (OR = .18; 95% CI = .09–.36) and paternal care (OR = .39; 95% CI = .18–.80). As a second step, we tested the interactions between the participants' gender and parental variables. No significant interaction was noted.

## DISCUSSION

Adopting an interactional approach, the present study aimed at comparing the effects of different variables on adolescent cigarette smoking. Specifically, we used social variables, such as modelling by peers and parents, the care provided by parents as perceived by the adolescent, and the psychological factor of self-regulatory efficacy. We also considered gender and age. Smoking appears to be a widespread behaviour among Italian adolescents, with approximately one-third of the sample indicating that they are regular smokers. This result is consistent with recent surveys that find there is a high rate of adolescent smokers in Italy (ESPAD group, 2016). Regarding the influence of socio-demographic characteristics, the results confirmed the influence of age on

adolescent cigarette smoking (Tyas & Pederson, 1998). Furthermore, it is acknowledged that initiation and regular smoking among youth typically increases with age and grade, and in fact, older participants in our sample were more likely to smoke than were the younger participants in our sample. On the other hand, gender did not influence adolescent cigarette smoking. Consistent with previous research (Page & Danielson, 2011), smoking rates among boys and girls were similar. Although, historically, the prevalence of smoking has been higher among males than females, in recent decades, the number of women who smoke has increased to the point where the rates of smoking between the genders are approximately equal (Schaap, et al., 2009).

We further found that tobacco use among adolescents in the Italian context is influenced by both personal attitudes and the surrounding environment, namely, family and peers. Surprisingly, within the family, only the father seems to have an important role in influencing adolescent smoking. Indeed, concerning parental modelling, we concluded that while paternal smoking was a great influence, maternal smoking was not. This result is difficult to interpret because some previous research has demonstrated the influence of both parents, with smoking mothers exerting a stronger influence on the probability that their children will become smokers than smoking fathers (Melchior et al., 2010; Escario & Wilkinson, 2015). However, the literature presents mixed results. For example, White (2012) found that maternal smoking increased the likelihood that girls would smoke, but not the likelihood that boys would experiment with smoking. We did not find a similar interaction. Moreover, because of recent societal changes, fathers are spending more time with their children than they did in the past (ISTAT, 2016b), and thus, they are becoming increasingly more important as role models, along with the mothers. That said, it is unclear why maternal modelling was not significant. It is suggested that mothers who smoke reduce the effect of their negative example through other behaviours, such as anti-smoking socialization. In fact, some scholars (Henriksen & Jackson, 1998) have found that even when parents smoke, they can strongly affect adolescent smoking if they employ specific anti-smoking strategies. Consistent with this thinking,

mothers seem to be more prone to socialize their children to adopt non-smoking behaviours (Engels & Willemsen, 2004).

Consistent with previous research (Hoffman et al., 2007; Bricker et al., 2009), our results confirmed the important role of peer modelling in determining cigarette smoking behaviours. Specifically, affiliations with smoking friends increases the likelihood of adolescent smoking. Because adolescents exhibit a need for social approval and group membership, they are more vulnerable during this period to conform to prevailing norms than they are during any other period (Hartup, 1997). Decisions regarding smoking behaviour have been often found to reflect choices about group acceptance, social approval and popularity (Kobus, 2003), which may explain the importance of peer modelling. Furthermore, the results revealed that perceived self-regulatory efficacy was a strong predictor of adolescent cigarette smoking whereby adolescents with low levels of such efficacy were more likely to smoke. Additionally, the degree of confidence exhibited by the adolescent to resist social pressures to engage in transgressive behaviours has proven to be an important preventive factor with respect to risky behaviours, a finding that is consistent with previous research (Chang et al., 2006; Lotrean et al., 2010).

With respect to the influence of the quality of the parent-child relationship, the results were consistent with those of the modelling effects we found. Furthermore, consistent with previous results (White, 2012), where only support from the father was associated with a reduced risk of smoking in adolescence, we found that only perceived low levels of affection from the father increased the likelihood of adolescent cigarette smoking, whereas the perceived affection from the mother was not significantly influential. This result, however, was unexpected in the Italian context, as the emotional bonding with both parents, and especially with the mother, is supposedly stronger than it is in other countries (Claes et al., 2003). We may interpret this result with respect to the function of cigarette smoking for adolescents, i.e., given that tobacco does not alter perception as do other substances, it is used less often as a coping resource. Rather, cigarette smoking is conceptualized as a problem behaviour that involves normative transgression (Turbin, Jessor &

Costa, 2000). It is well known that adolescents who experience high levels of parental support and affection have a reduced need to transgress (Simons-Morton, 2002) and that the standards and rules are attributable to a paternal function (Scabini & Cigoli, 2000). Accordingly, a lack of affection from the father may arouse an increased need to transgress, which then leads the adolescent to begin smoking. Nonetheless, we do not want to deny the importance of the relationship with the mother and its impact on various adjustment outcomes. For example, maternal affection is especially important for the well-being of the adolescent (Cheng & Furnham, 2004), and thus, a lack of involvement from the mother can result not only in internalizing but also in externalizing problems through behaviours such as substance use (Simons & Conger, 2007).

The present study has some limitations. Its greatest weakness is that it is cross-sectional. Hence, longitudinal studies are needed to verify the relationships found herein. Second, we investigated peer modelling through self-report data from adolescents, and it has been determined that adolescents sometimes perceive the prevalence of smoking to be higher among their peers than it is in actuality (Iannotti, Bush & Weinfurt, 1996). Accordingly, various measures may be employed in future research to strengthen the present results. Third, the generalizability of the findings herein to the larger population is limited because the sampling method was not representative of the Italian adolescent student population. Therefore, the replication of the study using other samples is needed to confirm the results. Finally, other family dimensions, such as smoking-specific parenting, should be investigated to extend the interpretations of our findings.

In sum, the current findings indicate that the father is a key figure in preventing adolescent cigarette smoking. Specifically, his care and affection can prevent children from becoming smokers, whereas his modelling as a smoker is a risk factor for adolescents. The influence of friends is also determined to be significant. Finally, not only are social factors important in explaining adolescent cigarette smoking, but perceived self-regulatory efficacy has been found to be a relevant psychological variable that is capable of predicting adolescent smoking. The adolescents' degree of

confidence in their ability to resist peer pressure to pursue harmful activities is an important protective factor.

Based on an understanding that adolescents should be encouraged to develop personal self-management and social skills that mitigate the effects of peer group influences, the results emphasize the importance of prevention programmes focused on teaching the skills necessary to resist direct and indirect social pressures to use tobacco. Additionally, interventions should be directed at facilitating protective parenting practices. Particularly, we found evidence of the importance of the father in preventing risky behaviours. In Western societies, the important role of the father in the overall functioning of the family is often diminished compared to that of mother. Accordingly, the results of this study highlight the need to promote the awareness of the fathers regarding their influence on their children's behaviours. Therefore, prevention programmes should specifically engage fathers because, too often, interventions targeting the overall family tend to involve only one parent, usually the mother (Choo & Shek, 2013). Thus, helping fathers to exhibit an authoritative parenting style that combines rules and standards with sensitivity, support and love, may be more effective in reducing the need to transgress, which leads adolescents to initiate smoking.

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**The relation of modelling and the perception of parental care with adolescent smoking: a  
cross-sectional study**

TABLE

Table 1. Binary logistic regression of smoke regularly: Odds ratios and confidence intervals.

<b>Independent variables</b>	<b>Odds Ratio</b>	<b>95% CI</b>
Gender (1 = Male)	.98	.45-2.11
Age	1.64**	1.14-2.32
<b>Modeling</b>		
Smoking mother (1 = yes)	2.02	.85-4.80
Smoking father (1 = yes)	2.45*	1.05-5.75
Having many smoking friends (1 = yes)	5.47**	2.36-12.67
<b>Self-regulatory efficacy</b>	.18**	.09-.36
<b>Parental bonding</b>		
Mother's care	1.52	.63-3.65
Father's care	.39*	.18-.80

Nagelkerke R<sup>2</sup>=.44

\*\* p<.01; \* p<.05